IDAPA 37
TITLE 03
CHAPTER 09

37.03.09 - WELL CONSTRUCTION STANDARDS RULES

000. LEGAL AUTHORITY (RULE 0).
The Idaho Water Resource Board adopts these Well Construction Rules pursuant to the authority provided by Section 42-238, Idaho Code. ()

001. TITLE AND SCOPE (RULE 1).

01. Title. These rules shall be cited as IDAPA 37.03.09, "Well Construction Standards Rules." ()

02. Scope. The Idaho Department of Water Resources is responsible for the statewide administration of the rules governing Well Construction. The rules establish minimum standards for the construction of new wells, the construction of low-temperature geothermal resource wells, and the modification and abandonment of existing wells. The intent of the rules is to protect the ground water resources of the state against waste and contamination. The rules are applicable to all water wells, monitoring wells, low temperature geothermal wells, injection wells and other artificial openings, excavations, or improvements in the ground that are more than eighteen (18) feet in vertical depth below land surface. The intent of the rules shall be observed for any hole constructed, modified, or improved, regardless of depth that could promote waste and contamination of the ground water resources of the state. ()

002. WRITTEN INTERPRETATION (RULE 2).
In accordance with Section 67-5201(19)(b)(iv), Idaho Code, the Idaho Department of Water Resources does not have written statements that pertain to the interpretation of the rules of this chapter, or to the documentation of compliance with the rules of this chapter. ()

003. ADMINISTRATIVE APPEALS (RULE 3).
Persons may be entitled to appeal agency actions authorized under these rules pursuant to Section 42-1701A, Idaho Code, and IDAPA 37.01.01, "Rules of Procedure of the Idaho Department of Water Resources". ()

004. INCORPORATION BY REFERENCE (RULE 4). ()

005. OFFICE HOURS -- MAILING ADDRESS AND STREET ADDRESS (RULE 5).

01. Office Hours. Office hours are 8 a.m. to 5 p.m. local time, Monday through Friday, except holidays designated by the State of Idaho. ()

02. Mailing Address. The mailing address for the state office is
Idaho Department of Water Resources,
P.0. Box 83720,
Boise, Idaho 83720-0098 ()

03. Street Address. The street addresses for the state office of the Department of Water Resources, the regional offices in Idaho Falls, Coeur d'Alene, Twin Falls, and Boise, and the satellite offices in Salmon, and Soda Springs may be obtained by calling the state office at (208) 287-4800, or by visiting the Department's website at http://www.idwr.idaho.gov. ()

006. PUBLIC RECORDS ACT COMPLIANCE (RULE 6).

Records maintained by the Department of Water Resources are subject to the provisions of the Idaho Public Records Act, Title 3, Chapter 3, Idaho Code. ()

007. OTHER AUTHORITIES REMAIN APPLICABLE (RULE 7).
Nothing in these rules shall limit the Director's authority to take additional or alternative actions in order to ensure compliance consistent with the intent of these rules as provided by Idaho law. ()

008. -- 009. (RESERVED).

010. DEFINITIONS (RULE 10).
Unless the context otherwise requires, the following definitions govern within these rules: ()

01. Abandoned Well (also Decommissioned Well). Any well which has been permanently removed from service by filling and/or plugging in accordance with these rules so that it is rendered unproductive, does not allow the transfer of fluids, and will not serve as a conduit for waste and contamination of the ground water resources. ()

02. Abandonment (also Decommissioning). The act of filling or plugging of a well so that the well will not: a) produce or accept fluids, b) serve as a conduit for the movement of contaminants, and c) allow the movement of surface or ground water into unsaturated zones, into another aquifer, or between aquifers. ()

03. Annular Seal. Approved seal material installed in a manner that completely fills the annular space between the borehole and permanent casing or between separate casing strings to act as a low-permeability barrier and prevent the horizontal and vertical movement of fluids. Annular seals create low-permeability barriers between the land surface and the subsurface, or between distinct subsurface zones, and are critical to the prevention of waste and contamination of the ground water resources. In some cases, an annular seal may extend upward and become continuous with the surface seal. ()

04. Annular Space. ~~The space between two (2) concentric cylindrical surfaces, one (1) of which surrounds the other, such as the space between the walls of a drilled hole (borehole) and~~ One-half (1/2) the difference in diameter between the borehole and the outside surface of ~~a~~ the nearest permanent casing, or ~~the space~~ between the inner and outer surfaces of two successive~~separate~~ permanent casing strings. ~~Annular space is calculated as one-half (1/2) the difference in diameter between the borehole and the outside of the nearest casing, or as one-half (1/2) the difference between the inside diameter of a larger casing and the outside diameter of the next smaller casing~~. ()

05. Aquifer. Any subsurface geologic zone, or naturally hydraulically connected zones, capable of storing and transmitting water to a well in sufficient quantities to make the production of water from such zone(s) feasible for beneficial use. ()

06. Area of Drilling Concern. Any area so designated by the Director in accordance with Section 42-238, Idaho Code. ()

07. Artesian Well. Any well or borehole that encounters pressurized ground water or low temperature geothermal resource under sufficient head to rise above the elevation at which it was first encountered whether or not the fluid flows at land surface. Artesian wells include flowing artesian wells – those wells in which the water rises to and flows naturally at the land surface. ()

08. Artificial Filter Pack (also Filter Pack). Clean, rounded, smooth, uniform, graded sand or gravel insert placed between the borehole wall and perforated well casing or well screen. A filter pack is used to prevent the movement of sand and other sediment into the well, and to enhance the ability of the well to yield water.()

09. Bentonite. A commercially processed, low permeability, sodium montmorillonite clay ~~approved~~ certified by the National Sanitation Foundation (NSF) for use in well construction, sealing, plugging, and abandonment. All approved bentonite products shall have a permeability rating not greater than 10^{-6} cm/sec. ()

a. **Chips**. Bentonite composed of pieces from 3/8-inch to 1 inch on their greatest dimension, and containing less than 2% by weight fines or powder. ()

b. **Granules (also Granulated Bentonite)**. Bentonite composed of pieces less than 3/8-inch on their greatest dimension, and containing less than 2% by weight fines or powder. ()

c. **Grout**. A mixture of bentonite and potable water to produce a sealant with an active solids content not less than 25% by weight (25% solids content by weight = 50 pounds bentonite per 18 gallons of water)~~, and a permeability not greater than 10^{-7} cm/sec~~. ()

d. **Pellets**. Bentonite manufactured for a specific purpose in the form of compressed and/or coated pellets of various size. ()

e. **Fines or Powder**. Dry bentonite material that passes a #~~8~~10 standard sieve. ()

10. **Board**. The Idaho Water Resource Board. (7-1-93)

11. **Bore Diameter**. The diameter of the subsurface borehole made during the drilling process. ()

12. **Borehole** (also Well Bore). The subsurface hole created during the drilling process. ()

13. **Bottom Hole Temperature**. The temperature of the ground water encountered at or near the bottom of a well. ()

14. **Casing**. A conduit of pipe used to: a) prevent caving and/or collapse of the borehole, b) serve as access and protective housing for pumping equipment, c) provide a pathway for the upward flow of water within the well, d) serve as a solid inner barrier to allow for the installation of an annular seal, and e) serve in conjunction with annular seals as a means to prevent waste and contamination of the ground water resources. Casing does not include screens, perforated sections, or liners used in the construction of the well. ()

15. **Cathodic Protection Well**. Any artificial excavation in excess of eighteen (18) feet in vertical depth constructed for the purpose of protecting certain metallic equipment in contact with the ground. Commonly referred to as cathodic protection. (7-1-93)

16. **Closed Loop Heat Exchange Well**. A ground source thermal exchange well constructed for the purpose of installing any underground system through which fluids are circulated but remain isolated from contact with the subsurface. ()

17. **Conductor Pipe**. A permanent, relatively short string of large-diameter casing which is set to keep the top of the borehole open and provide a means of returning the drilling fluid from the well bore to the surface until the first casing string is set in the well. ()

18. **Confining Layer**. A subsurface zone of low-permeability earth material lying above and/or below a water-bearing zone that restricts the movement of water from one zone to another. The term does not include topsoil. ()

19. **Consolidated Formations**. Naturally occurring earth materials that have been lithified (turned to stone). The term is sometimes used interchangeably with the word “bedrock” and includes rocks such as basalt, granite, rhyolite, sandstone, limestone and shale. ()

20. **Contaminant**. Any chemical compound, biological agent, or physical property not occurring naturally in ground water or that occurs naturally at lower concentrations or to lesser degrees. Contaminant also includes thermal or aesthetic properties that result in ground water becoming less suitable for a beneficial use as determined by the Director. ()

21. Contamination. The direct or indirect introduction into ground water of any contaminant caused in whole or in part by human activities. The term includes the introduction of any contaminant from one geologic zone to another, and the introduction of any contaminant that may cause a violation of the Ground Water Quality Rule, IDAPA 58.01.11. ()

22. Decommissioned Well. An Abandoned Well. ()

23. Department. The Idaho Department of Water Resources. (7-1-93)

24. Director. The Director of the Idaho Department of Water Resources or his duly authorized representatives. (7-1-93)

25. Disinfection. The introduction of chlorine or other agent or process approved by the Director in sufficient concentration and for the time required to inactivate or kill fecal and coliform bacteria, indicator organisms, and other potentially harmful pathogens. ()

26. Decontamination of Equipment. The process of cleaning equipment intended for ~~insertion~~ use in~~to~~ an existing well in order to prevent the introduction of contaminants. ()

27. Drive Point (also Sand Point). A hole through which ground water of any temperature is sought or encountered created by joining a "drive point" to a length of pipe and driving or drilling the assembly into the ground. Drive point holes are not allowed to exceed 18-feet in depth without meeting all requirements set forth in these rules. The depth of the hole is determined by measuring the maximum vertical distance between the natural land surface and the deepest portion of the hole. ()

28. Grout. A mixture of cement and potable water (as in neat cement), neat cement grout, or bentonite and potable water of a consistency appropriate to be pumped through a pipe and emplaced as seal material.()

29. Hydro-Fracturing. A process whereby potable water or other Department-approved fluid is pumped under high pressure into a well to fracture the reservoir rock surrounding the well bore in order to increase flow into the well. ()

30. Injection Well. Any excavation or artificial opening into the ground which meets the following three (3) criteria: (7-1-93)

a. It is a bored, drilled or dug hole, or is a driven mine shaft or driven well point; and (7-1-93)

b. It is deeper than its largest straight-line surface dimension; and (7-1-93)

c. It is used for or intended to be used for subsurface placement of fluids. (7-1-93)

31. Intermediate Casing String. The casing installed below the surface casing within any well to seal out specific subsurface zones. Such strings may be overlapped, or telescoped, and sealed into the surface casing, or extend continuously to land surface. ()

32. Liner. A conduit of pipe used to: a) serve as access and protective housing for pumping equipment, and b) provide a pathway for the upward flow of water within the well. Liner does not include casing required to: a) prevent caving and/or collapse of the borehole, or b) serve as a solid inner barrier to allow for the installation of an annular seal. ()

33. Mineralized Water. Any ground water having a TDS (total dissolved solids) concentration greater than 5000 ppm. ()

34. Modify. To deepen a well, increase or decrease the diameter of the casing or the well bore, install a liner, place a screen, perforate existing casing or liners, alter an annular seal, or any other activity that causes a violation of these rules. ()

35. Monitoring Well. Any well more than eighteen (18) feet in vertical depth constructed to evaluate, observe or determine the quality, quantity, temperature, pressure or other characteristics of the ground water or aquifer. (7-1-93)

36. Natural Filter Pack (also Natural Pack). Graded sand and gravel between the borehole and the perforated casing or well screen produced from the native aquifer material during well development. A filter pack is used to prevent the movement of sand and other sediment into the well, and to enhance the ability of the well to yield water. ()

37. Neat Cement. A mixture of ASTM Type I (API Class A & B) or ASTM TYPE III (API Class C) Portland cement ~~Types I, II, or III~~ with not more than~~:~~

~~a.S~~six and three tenths ~~and one half~~ (6.~~35~~) gallons of potable water per 94 pound sack of cement ~~for mixtures to be poured; or~~ ()

~~b.Seven (7) gallons of potable water per 94 pound sack of cement for mixtures to be pressure pumped.~~ ()

38. Neat Cement Grout. A mixture of neat cement and up to five (5) % by weight pre-hydrated bentonite. The ~~additional~~ total amount of water used, including that used to pre-hydrate bentonite, shall not exceed six and one-half (~~0~~6.5) gallons per 94-pound sack of cement ~~for each one (1)% bentonite added~~. ()

39. Pitless Adaptor (also Pitless Unit). An assembly of parts attached to a well casing to allow for subsurface pump discharge and access to the interior of the well casing for installation or removal of pump appurtenances while preventing contaminants from entering the well. ()

40. Potable Water. Water suitable for human consumption. ()

41. Pressure Pumping. The act or process of forcing, with mechanical pressure, an approved grout mixture through a pipeline (~~tremie~~tremie pipe) into an annular space to create an annular seal, or from within a borehole or casing into a position outside the casing to create a low permeability plug at a desired location. ()

42. Production String. The casing through which a ground water resource of any temperature is produced. The production string shall be continuous from the producing zone to land surface. ()

43. Remediation Well. A well used to inject or withdraw fluids, vapor, or other solutions approved by the Department for the purposes of remediating, or controlling potential or known contamination. Remediation wells include those used for air sparging, vapor extraction, or injection of chemicals for remediation or in-situ treatment of contaminated sites. ()

44. Seal Material (also Seal). The low permeability material, such as bentonite, grout, or neat cement placed into an annular space or into a required location outside the casing to~~hat~~ prevent~~s~~ the waste and contamination of ground water~~horizontal and vertical movement of water, or the mixing (commingling) of waters from discrete aquifers~~. ()

45. Stable Unit. Those portions of consolidated formations that are sufficiently hard and durable to sustain an open borehole without caving or producing obstructions without the aid of fluid hydraulics or chemical stabilization. ()

46. Surface Casing. The outermost, shallowest permanent casing string used to isolate surface zones, allow for the installation of a surface seal, to provide sufficient pressure control during drilling operations, and to support the wellhead. ()

47. Surface Seal. An annular seal installed between the borehole wall and the outside perimeter of the surface casing that prevents the horizontal and vertical movement of water. Surface seals create a low-permeability barrier between the land surface and subsurface zones. ()

48. Temporary Casing. Steel pipe used to retain the sides of the borehole within unstable units or unconsolidated formations and to prevent the ingress of water into the borehole during drilling and well construction. Temporary casing is removed following the installation of the permanent well casing and prior to well completion. ()

49. Thermoplastic Pipe. Plastic piping material meeting the requirements of ASTM F 480 and designed for use as well casing and/or liner. ()

50. Unconsolidated Formations. Naturally occurring earth materials that have not been lithified (not turned to stone). The term includes materials such as alluvium, soil, sand, silt, gravel, clay, and overburden. ()

51. Unstable Unit. All unconsolidated formations, and those portions of consolidated formations that are not sufficiently hard or durable to sustain an open borehole without caving or producing obstructions without the aid of fluid hydraulics or chemical stabilization. ()

52. Unusable Water Well. A borehole or constructed well intended and permitted for ground water production that, for any reason, fails to yield water of adequate quantity or desirable quality for its intended and authorized use. ()

53. Waste. The loss, transfer, or physical migration of a ground water resource, thermal characteristic, or natural artesian pressure from any aquifer caused by improper construction, misuse, or failure to maintain any well, including but not limited to: ()

a. The flow of water from an aquifer into an unsaturated subsurface zone; ()

b. The transfer and/or mixing of waters from one aquifer to another (aquifer commingling); and ()

c. The release of ground water to the land surface, by natural artesian flow, whenever such release does not comply with an authorized beneficial use. ()

54. Well. An artificial excavation or opening in the ground more than eighteen (18) feet in vertical depth below the natural land surface by which ground water of any temperature is sought or obtained. The depth of a well is determined by measuring the maximum vertical distance between the land surface and the deepest portion of the well. Well also means any waste disposal and injection well as defined by Section 42-3902, Idaho Code, any test well, monitoring well, cathodic protection well, observation well, recycling well, ground source heat exchange well, or any exploratory well more than eighteen (18) feet in vertical depth below the natural land surface that is constructed to evaluate the ground water resource or to evaluate contamination of the resource. Well does not mean a hole drilled for mineral exploration, oil and gas exploration (for which a permit has been issued pursuant to Section 47-320, Idaho Code), for mine shafts or adits, for temporary construction dewatering, for foundation geotechnical evaluations, or for elevator shaft installation. ()

55. Well Development. The act of bailing, jetting, pumping, or surging water in a well to remove drilling fluids, fines, and suspended materials from within the borehole, screen, filter pack, and aquifer to establish the optimal hydraulic connection between the well and the aquifer. ()

56. Well Driller. Any driller or operator authorized under Section 42-238, Idaho Code. ()

57. Well Drilling. The act of constructing, modifying, or abandoning a well. ()

58. Well Owner. The owner of the land on which the well is located unless a deed, covenant, contract, easement, or other documentation acceptable to the Director demonstrates that the well is the responsibility of another party. ()

59. Well Rig. Any power driven percussion, rotary, boring, digging, jetting, or auguring machine used in the construction or modification of a well. ()

011. ABBREVIATIONS (RULE 11).

012. -- 024. (RESERVED).

025. GENERAL STANDARDS FOR CONSTRUCTION OF COLD WATER WELLS (RULE 25).

01. Standards for Every Well. The Well Driller shall construct each well: ()

a. In accordance with these rules and with the conditions of approval of any drilling permit issued pursuant Section 42-235, Idaho Code, and in a manner that will guard against waste and contamination of the ground water resources. The adopted rules are minimum standards that must be adhered to in the construction of all wells, and in the modification or abandonment of existing wells. If the well driller determines, during construction, modification, or abandonment of any well, that the minimum standards are not sufficient to protect the ground water resources, the well driller shall take measures over and above these minimum standards as necessary to achieve this goal. The well driller and well owner are charged with the responsibility of taking appropriate steps to guard against waste and contamination of the ground water resources; ()

b. Based on the geologic and ground water conditions known to exist or anticipated at the well site; ()

c. Such that it is capable of producing, where obtainable, the quantity of water to support the approved beneficial uses by the well owner, subject to law; ()

d. Such that it complies with these standards and the following siting and distance requirements:

Separation of Well from:	Minimum Separation Distance (feet)
Existing Public Water Supply well	50
Other existing well	25
Septic drain field	100
Septic tank	50
~~Septic tank, d~~Drainfield ~~or outflow pipe~~ of system with more than 2,500 GPD of sewage inflow	300
Sewer line ~~(gravity)~~	50
Secondary sewer line, minimum schedule 40 and pressure-tested ~~(pressure)~~	~~100~~25
Property line	~~10~~5
Permanent buildings or structures	10
Livestock holding boundary, more than 50 head for 30 or more consecutive days per year	300
Above ground chemical storage tanks	50
Streams, canals, irrigation ditches or laterals, and other permanent, temporary~~,~~ or intermittent (greater than 30 consecutive days per year) bodies of water	50

()

Compliance with the above siting and separation distances does not exempt the driller from complying with other requirements established by other authorized bodies (e.g. District Health Departments, Idaho Department of Environmental Quality, etc.); ()

e. Such that, if used for injection, it complies with these standards and IDAPA 37.03.03, "Rules for the Construction and Use of Injection Wells"; and ()

f. Such that, if used for a Public Water Supply, it complies with these standards and with IDAPA 58.01.08, "Idaho Rules for Public Drinking Water Systems." ()

g. The Director may require measures beyond the minimum standards when determined necessary to protect ground water resources. Areas of Drilling Concern (ADC), pursuant to 42-238, Idaho Code, and Areas of Special Geologic Conditions (ASGC) identified by the Department shall require more stringent well construction practices. The Well Driller shall observe and comply with all specific additional requirements within such identified areas. ()

02. Waivers. The Well Driller may submit a detailed plan and written request to the Director for a waiver of these minimum standards. The waiver may be granted if the Director determines that the ground water resources and public health will be protected according to the plan, and the waiver will not conflict with other requirements established by authorized bodies (e.g. District Health Departments, Idaho Department of Environmental Quality, etc.). Well drilling shall not commence until the Director has approved the plan and granted the waiver in writing. If a waiver is granted, all well drilling activities shall adhere to the plan as approved. ()

03. Requirements for Licensure. No person except those licensed as Well Drillers under the authority of Section 42-238, Idaho Code, and IDAPA 37.03.10, "Well Driller Licensing Rules" shall construct, modify or abandon a well. ()

04. Documents to be Provided to Well Owner. The Well Driller shall provide the well owner with a copy of the approved well drilling permit, and a copy of the well driller's report upon completion of the well. ()

026. -- 029. (RESERVED).

030. STANDARDS FOR ALL CASING AND LINERS (RULE 30).

01. Requirements for Casing. The Well Driller shall install steel, or steel and thermoplastic casing in every well. All casing and liner to be installed must be in like-new condition, free of all defects, and clearly marked by the manufacturer with all specifications required by these rules. ()

02. Requirements for Casing and Liner Installation. The Well Driller shall:

a. Install a minimum of 20 feet of steel surface casing that meets or exceeds specifications of Rule 31.01; ()

b. Ensure that the steel surface casing extends not less than twelve (12) inches above the land surface and finished grade, and not less than eighteen (18) feet below land surface; ()

c. Ensure that all casing extends and is properly sealed to the depth required by these Rules; ()

d. Prior to the completion of a well, install onto the steel surface casing: a) a one-fourth inch (1/4") thick, solid, new or like-new steel plate welded to and completely covering the casing, or b) a commercially manufactured sanitary well cap, or c) a commercially manufactured, water-tight, snorkel-vented or non-vented well cap on any well susceptible to submergence, and d) a Department approved control device per Rule 74 on any well that flows at land surface. Cast aluminum well caps are prohibited; ()

e. Join all casing and liner lengths in accordance with current industry standards and practices, and/or manufacturer's specifications and recommendations; ()

f. Ensure all joints are straight and watertight; ()

g. Not allow perforated casing to extend into or through any confining layer separating aquifers or zones of differing artesian pressure; and ()

h. Not allow perforated casing to extend into or through any confining layer that would otherwise prevent the migration of water from one zone to another. ()

03. Requirement for Integrity of Casing and Liners. The Well Driller shall install casing and liners of sufficient strength to withstand normal subsurface forces and corrosive effects. ()

031. STANDARDS FOR STEEL CASING AND LINERS (RULE 31).

01. Minimum Steel Casing Specifications. The Well Driller shall install steel casing that meets or exceeds the American Society of Testing and Materials (ASTM) standard A53, Grade B or American Petroleum Institute (API) 5L Grade B, and that meets the following specifications: ()

Minimum Single-Wall Steel Well Casing Thickness for Selected Diameters (in.)

Nominal Diameter (in.)	6[1]	8	10	12	14	16	18	20	22	24	26	28	30
Depth (ft.)	**Nominal Wall Thickness (in.)**												
<100	0.2501~~09~~	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250~~313~~	0.250	0.250	0.2503~~13~~
100-200	0.2501~~41~~	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250~~313~~	0.250	0.250	0.2503~~13~~
200-300	0.250	0.250	0.250	0.250	0.250	0.250	0.2503~~13~~	0.250~~313~~	0.250	0.250~~313~~	0.250	0.250	0.2503~~13~~
300-400	0.250	0.250	0.250	0.250	0.250	0.2503~~13~~	0.2503~~13~~	0.250~~313~~	0.250	0.375	0.375	0.375	0.375
400-600	0.250	0.250	0.250	0.250	0.250	0.2503~~13~~	0.2503~~13~~	0.250~~313~~	0.375	0.375	0.375	0.375	0.3754~~38~~
600-800	0.250	0.250	0.250	0.250	0.250	0.2503~~13~~	0.3753~~13~~	0.375	0.375	0.375	0.375	0.375	0.3754~~38~~
800-1000	0.250	0.250	0.250	0.250	0.3751~~3~~	0.3751~~3~~	0.3751~~3~~	0.375	0.375	0.375~~438~~	0.375	0.375	0.3755~~0~~
1000-1500	0.2850	0.3222~~50~~	0.3651~~3~~	0.3751~~3~~	0.3751~~3~~	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375
1500-2000	0.2850	0.3222~~50~~	0.3651~~3~~	0.3751~~3~~	0.3751~~3~~	0.375	0.375	0.375~~438~~	0.375	0.375	0.375	0.375	0.375

[1]For nominal casing diameters less than 6 inches, the minimum nominal wall thickness shall be equivalent to ASTM Schedule 40. [2]For ~~24 and 30 inch nominal casing diameters below 1000 feet, and for~~ any other casing diameter not addressed herein, prior Department approval is required. ()

02. Additional Requirements for Steel Casing and Liner. The Well Driller shall: ()

a. Join casing and liner lengths by welded or threaded joints; and ()

b. Ensure that welded joints are made using welding rods of at least equal quality to the casing metal, are at least as thick as the wall thickness of the well casing, and are fully penetrating. Casing ends to be joined by welding shall be properly prepared, beveled and gapped to allow full penetration of the weld. Welded joints shall have a minimum of two (2) passes including a "root" pass and have minimal undercut when complete. ()

032. -- 039. (RESERVED).

040. STANDARDS FOR THERMOPLASTIC PIPE CASING AND LINERS (Rule 40).
Thermoplastic pipe used as casing or liner shall conform to ASTM F 480 and NSF-WC. ()

01. Conditions for the Use of Thermoplastic Pipe Casing and Liners. ()

a. Thermoplastic pipe may be used as casing in all monitoring wells. Thermoplastic pipe used as casing in monitoring wells shall have a minimum rating of schedule 40. If used as casing within unstable units, thermoplastic pipe shall be centralized and supported as described in Rule 040.b.iii below. ()

b. Thermoplastic pipe may be used as casing or liner in other wells only when drilling of the borehole confirms its suitability for use. The conditions for use of thermoplastic pipe as casing in other wells shall conform to the following: ()

i. Stable Units: Thermoplastic pipe having a minimum rating of SDR 21, or a minimum rating of schedule 40 for nominal diameters of 4 ½" or less, may be used as liner only within uninterrupted stable units. ()

ii. Stable Units: Thermoplastic pipe having a minimum rating of SDR 17, or a minimum rating of schedule 40 for nominal diameters of 4 ½" or less, may be used as casing within uninterrupted stable units. ()

iii. Unstable Units: For all applications, thermoplastic pipe used as casing shall have a minimum rating of SDR 17, or a minimum rating of schedule 40 for nominal diameters of 4 ½" or less, and shall be centralized a minimum of every forty (40) feet, and ~~shall be~~ fully supported throughout the unstable zone(s) by filter pack and/or seal material as required by these rules. ()

c. In addition to the above and for each casing or liner application, the Well Driller shall ensure the selection and use of the appropriate, minimum-rated thermoplastic pipe with respect to differential hydraulic pressures in accordance with the manufacturer's Resistance to Hydraulic Collapse Pressure (RHCP) specifications. In no instance shall the Well Driller use thermoplastic pipe for any application that would exceed the manufacturer's RHCP specifications or total depth recommendations. ()

02. Additional Requirements for Thermoplastic Pipe Casing and Liner. All thermoplastic pipe casing and liner shall be installed in accordance with the manufacturer's recommendations and specifications, and as required by these rules. The Well Driller shall: ()

a. Not use thermoplastic pipe as casing or liner in any Low Temperature Geothermal Resource well or Geothermal Resource well; ()

b. Not use thermoplastic pipe as working casing while drilling the borehole; ()

c. Not drive, drop, force, jack, or push thermoplastic pipe into place. Thermoplastic pipe shall be lowered or floated into an oversized, obstruction-free borehole; ()

d. Not use cement-based seal materials in direct contact with thermoplastic pipe unless approved by the Director; ()

e. Ensure that thermoplastic pipe extending above-ground is protected from physical and ultraviolet light damage by enclosing it within steel surface casing according to Rule 030.02.b; and ()

f. Ensure that the weight of the pump assembly, if secured to the thermoplastic pipe, does not exceed the weight limitations per manufacturer's recommendations. ()

041. STANDARDS FOR MINIMUM WELL CASING OR LINER SIZE (RULE 41).
Based on the yield the well owner requires and on subsurface conditions, the Well Driller shall install casing and/or liner of sufficient size to produce the desired yield without harm to the aquifer. ()

042. STANDARDS FOR PLUMBNESS AND ALIGNMENT OF CASING AND LINER (RULE 42).

The Well Driller shall install casings and liners sufficiently plumb and straight to allow the installation or removal of screens, liners, pumps and pump columns without binding or having adverse effects on the operation of the installed pumping equipment. If it is determined that the borehole, casings, and/or liners are not sufficiently plumb and straight to allow the above tasks as described, the well driller shall repair or abandon the well in accordance with these rules. ()

043. -- 048. (RESERVED).

049. STANDARDS FOR ARTIFICIAL, NATURAL, AND RESERVE FILTER PACK (RULE 49).

01. The Well Driller shall ensure that artificial, natural, and reserve filter pack (the additional amount of filter pack material emplaced above a well screen to allow for settling) shall not extend into ~~or through~~ any confining layer separating aquifers or zones of differing artesian pressure. ()

02. The Well Driller shall not install or develop a filter packed interval that extends into ~~or through~~ any confining layer that would otherwise prevent the migration of water from one zone to another. ()

050. STANDARDS FOR ANNULAR SEALING (RULE 50). See Appendix 1 for general well sealing diagrams.

01. Requirements for Every Well. The Well Driller shall:

a. Install annular seals in every well to prevent: ()

i. The downward movement of surface fluids; ()

ii. The vertical movement of artesian waters; ()

iii. The waste of ground water, the flow of ground water from one aquifer to another, or the exchange of ground water between aquifers; and ()

iv. The downward migration of water from any saturated zone not protected by an overlying confining layer; ()

b. Ensure that all seals are of sufficient length and thickness to withstand the maximum natural vertical and horizontal hydraulic pressure differential(s) encountered, and are of sufficient integrity to produce a positive seal at the required location(s); ()

c. Ensure that all ~~known~~ water bearing zones known to contain~~ing~~ contaminants are isolated by a continuous seal extending a minimum of ten (10) feet above to a minimum of ten (10) feet below the contaminated zone(s); and ()

d. Ensure all seals are placed into an annular space of not less than one and one-half (1½) inches, and completely fill the annular space and any voids created during the drilling process as required by these rules. ()

02. Additional Requirements For Sealing Artesian Wells. If the Well Driller constructs a well that encounters or produces from artesian ground water, the Well Driller shall: ()

a. Install unperforated well casing from the land surface into the confining layer immediately overlying the production zone(s); ()

b. Install an annular seal(s) into all confining layers below and adjacent to the highest artesian head encountered ~~the confining layer immediately overlying any artesian zone~~; ()

c. Install a surface seal to a minimum depth of eighteen (18) feet below land surface; ()

d. Ensure that no leaks exist around or through the well casing prior to removing the drilling rig from the site; ()

e. Not install any required seal within any confining layer subject to artesian pressure with any method that requires the in place perforation of casing; and ()

f. Comply with additional requirements of the following subsections as applicable. ()

03. Additional Requirements for Sealing Wells in Unconsolidated Formations Without Confining Layers. If the Well Driller constructs a well that encounters or produces water from unconsolidated formations without penetrating a confining layer, the Well Driller shall: ()

a. Install unperforated well casing from the land surface to a depth of not less than five (5) feet below the static ground water level, and to a minimum depth of eighteen (18) feet below land surface; and ()

b. Install a surface seal to a minimum depth of eighteen (18) feet below land surface. ()

04. Additional Requirements for Sealing Wells in Unconsolidated Formations With Confining Layers. If the Well Driller constructs a well that encounters or produces water from unconsolidated formations and penetrates one or more confining layer(s), the Well Driller shall: ()

a. Install unperforated well casing from the land surface into the confining layer immediately overlying the production zone(s); ()

b. Install an annular seal(s) through the uppermost confining layer; and ()

c. Install a surface seal to a minimum depth of eighteen (18) feet below land surface. ()

05. Additional Requirements for Sealing Wells in Consolidated Formations. If the Well Driller constructs a well that encounters or produces water from consolidated formations, the Well Driller shall adhere to one (1) of the following methods: ()

Method 1.

a. Install unperforated well casing from the land surface to a solid, non-weathered, non-fractured zone of the consolidated formation overlying the uppermost, targeted water-bearing zone(s); ()

b. Install a continuous annular seal(s) from the solid, non-weathered, non-fractured zone of the consolidated formation (as described in method 1a. above) to the land surface. ()

Method 2.

a. Install unperforated well casing from the land surface to a minimum of five (5) feet into a solid, non-weathered, non-fractured zone of the consolidated formation overlying the uppermost, targeted water-bearing zone(s); ()

b. Install an annular seal(s) a minimum of five (5) feet into the solid, non-weathered, non-fractured zone of the consolidated formation (as described in method 2a. above); and ()

c. Install a surface seal to a minimum depth of eighteen (18) feet below land surface. ()

Method 3.

a. Install unperforated well casing from the land surface to a solid, non-weathered, non-fractured zone of the consolidated formation overlying the uppermost, targeted water-bearing zone(s); ()

b. Install an annular seal or plug of low permeability seal material beginning at and in direct contact with the interface of the solid, non-weathered, non-fractured zone of the consolidated formation (as described in method 3a. above) and extending upward a minimum of ten (10) feet above said interface; and ()

c. Install a surface seal to a minimum depth of eighteen (18) feet below land surface. ()

Note: The minimum required annular space of one-half (1½) inches may be reduced to one (1) inch for pressure pumping methods A~~1~~ and B~~2~~ if cement grout or neat cement is pumped from the bottom upward to install a seal no greater than ten (10) feet in length. The minimum required annular space of one and one-half (1½) inches is not required when pressure-grouting methods are employed for pressure pumping method ~~3~~C. See Appendix 2 for general pressure pumping method diagrams. ()

06. Additional Requirements for Sealing All Wells. If the Well Driller constructs any well in a manner that creates less than a one and one-half (1½) inch annular space, all seals shall be installed by pressure pumping a sufficient amount of approved grout to produce a positive seal at all required intervals according to subsections 01 through 05. ()

~~**051. MULTIPLE AQUIFER WELLS: WAIVER REQUIRED (RULE 51).** The Well Driller shall be responsible for constructing each well in a manner that ensures production from only one aquifer without allowing waste, flow, exchange, movement or migration of waters as described in Rule 50.01. The Well Driller may request a waiver, per Rule 025.02, to allow for the production of waters, and/or the mixing of waters, from different aquifers only in those instances necessary to obtain a required volume of water for an authorized beneficial use. ()~~

052. STANDARDS FOR APPROVED SEAL MATERIAL (RULE 52). The Well Driller may use only bentonite, neat cement or neat cement grout as defined and herein described to seal wells. The Well Driller shall adhere to the following: ()

01. Standards for Bentonite Seal Materials.

a. The Well Driller may use chips, granules, pellets, or grout in the installation of seals or in the abandonment of wells. ()

b. The Well Driller shall mix and install bentonite in accordance with the manufacturer's specifications, and as required by these rules. ()

c. The Well Driller may use only polymer additives that are designed and manufactured to meet industry standards to be non-degrading and not promote growth of microorganisms. ()

d. The Well Driller may add rounded silica sand, of any gradation between standard sieve sizes #50 and #10, to dry bentonite or bentonite grouts not to exceed a by-weight ratio of five (5) parts sand to one (1) part bentonite (250 lbs sand to 50 lbs. bentonite). If sand is added to any bentonite seal material, it shall be added and/or mixed in a manner to prevent layering and segregation. ()

e. Non-NSF certified bentonite products may only be used with prior approval from the Director. ()

02. Standards for Cement Seal Materials.

a. All grouts shall be mixed and installed in accordance with the American Petroleum Institute Standards - API Class A through H, as found in API RP10B-2 “Recommended Practice for Testing Oil Well Cements and Cement Additives,” or other Department approved standard. ()

b. Cement-based seal materials shall not be placed in direct contact with thermoplastic pipe used as casing or liner unless approved by the Director. ()

c. Aggregate, sand, reacting or non-reacting filler materials, expanding agents, and accelerating or retarding agents shall not be added without prior Department approval. ()

03. Prohibited Seal Materials. The Well Driller shall never use drill cuttings, dirt, soil, sand, gravel, or puddling clay to seal a well. ()

053. STANDARDS FOR SEAL MATERIAL INSTALLATION (RULE 53).
The Well Driller shall be responsible for ensuring that the borehole is constructed to provide sufficient annular space for the effective and successful placement of seal material. The Well Driller shall adhere to the minimum required annular spaces specified in the table of Rule 54, unless an exemption is granted by prior Departmental approval or otherwise exempted herein. ()

01. Dry Seal Materials. The Well Driller shall adhere to the following as applicable:

a. Bentonite chips and pellets may be installed below the ground water level; ()

b. Bentonite chips and granules may be installed above the ground water level; ()

c. Bentonite granules shall not be installed below the ground water level or into a wet annular space;()

d. All dry bentonite products shall be poured at a controlled rate and tagged at intervals not greater than ten (10) feet to prevent bridging and ensure a continuous seal; ()

e. Bentonite chips shall be hydrated at intervals not greater than ten (10) feet; and ()

f. For all annular seals in excess of 100 feet in length, centralizers shall be used at intervals not greater than 100 feet for steel, and not greater than 40 feet for thermoplastic pipe, throughout the interval to be sealed. ()

02. Grout Seal Materials. The Well Driller shall adhere to the following as applicable:

a. All grout material used to create any seal below the ground water level shall be emplaced from the bottom upward in a single, continuous operation by pressure pumping in a manner that ensures positive displacement and achieves a permanent seal at the required interval(s); ()

b. All grout material used to create any seal below the ground water level shall be emplaced by methods that prevent segregation or dilution of the material; ()

c. Bentonite grout shall not be used to create any required seal above the ground water level unless the mixture contains a minimum by-weight ratio of four (4) parts sand to one (1) part bentonite. All grout material used to create any seal above the ground water level may be emplaced by pressure pumping, or dump bailing directly to the intended and required point of application. ~~The maximum allowable depth of placement for any grout to be surface poured is 40 feet~~; ()

d. If cement grouts are pressure pumped to create any seal above the ground water level, care shall be taken to minimize the occurrence of flash setting; ()

e. If a tremie or other pipe is used to emplace grout material, the discharge point shall be submerged into the grout to ensure a continuous seal is created; ()

f. For any method, care shall be taken to prevent displacement of emplaced grout by vacuum or other mechanism; and ()

g. For all annular seals in excess of 100 feet in length, centralizers shall be used at intervals not greater than 100 feet for steel, and not greater than 40 feet for thermoplastic pipe, throughout the interval to be sealed. ()

054. MINIMUM ANNULAR SPACE AND MAXIMUM DEPTH REQUIREMENTS BY SEAL

MATERIAL TYPE AND PLACEMENT METHOD (RULE 54). The Well Driller shall adhere to the following table to determine the minimum required annular space in the construction of all wells, except as noted in Rule 050.05. ()

Reference Table for Seal Material Placement

Seal Material Type	Placement Method	Minimum Required Annular Space (in.)	~~Saturated Annular Space~~Placed into or through fluid	~~Unsaturated Annular Space~~Placed into a dry annular space	Maximum Depth of Placement (ft.)	Foot Notes
Bentonite Chips or Pellets	Dry Pour from Surface	1.5	Allowed	Allowed	~~50~~100	1, 3
Bentonite Chips or Pellets	Dry Pour from Surface	~~2~~3.0	Allowed	Allowed	~~1~~300	1, 3
Bentonite Chips or Pellets	Dry Pour from Surface	4.0	Allowed	Allowed	500	1, 3
Bentonite Granules	Dry Pour from Surface	1.5	Not Allowed	Allowed	~~5~~100	2, 3
Bentonite Granules	Dry Pour from Surface	2.0	Not Allowed	Allowed	~~1~~300	2, 3
Bentonite Granules	Dry Pour from Surface	3.0	Not Allowed	Allowed	500	2, 3
Bentonite Grout	Pressure Pumping Method A, B, C, ~~or~~ D, E	1.5	Allowed	Not Allowed*	Any	5
Neat Cement or Neat Cement Grout	Pressure Pumping Method A, B, D, ~~or~~ E	1.0	Allowed	Allowed	Any	4
Neat Cement or Neat Cement Grout	Pressure Pumping Method A, B, ~~or~~ C, D, E	2.0	Allowed	Allowed	Any	4

Footnotes:

1. Shall be poured at a controlled rate, and shall be hydrated and tagged at intervals not greater than ten (10) feet.
2. Shall be poured at a controlled rate, and shall be tagged at intervals not greater than ten (10) feet.
3. If bridging occurs, the seal shall be completed by inserting a tremie pipe at the lowest bridge point and pumping grout upward to form a continuous seal.
4. If grout does not return to the surface, the seal shall be completed by a dry pour method in accordance with these rules.
5. Shall not be used to create any annular seal above the ground water level.

* Bentonite grout containing a minimum by-weight ratio of four (4) parts sand to one (1) part bentonite may be placed into a dry annular space. ()

Pressure Pumping Methods: (see Appendix 2 for general pressure pumping method diagrams).

Pressure pumping method A:
Pressure pumping method B:
Pressure pumping method C:
Pressure pumping method D:
Pressure Pumping Method E: ()

055. RESUMPTION OF CONSTRUCTION FOLLOWING PLACEMENT OF SEAL MATERIAL

(RULE 55).
The Well driller shall adhere to the following as applicable:

01. If cement-based grouts are used to create any seal, casing may only be repositioned or further driven immediately following the grout placement. A permanent casing string with which a seal has been made shall not be moved or driven following the initial set of any cement-based grout, and ~~C~~construction ~~of a well~~ shall not resume for a minimum of eight (8) hours following the initial set~~until after final set of the mixture has been achieved~~; ()

02. If a cement or bentonite seal is compromised following placement, the seal shall be repaired or replaced as necessary; and ()
~~In no case shall a permanent casing string with which a seal has been made be moved or driven following the initial set of any cement based grout seal;~~ ()

~~03.Bentonite Grouts???~~

~~04.~~03. ~~Dry Bentonite???~~Once construction resumes, care shall be taken to prevent the contamination or corruption of all emplaced seals. ()

056. STANDARDS FOR USE AND SEALING ~~OF~~ WITH TEMPORARY CASING (RULE 56).
The Well Driller may install temporary steel casing during well construction to maintain an open or dry borehole. As the the temporary casing is removed, the Well Driller shall simultaneously place approved seal material in the annular space(s) in accordance with the procedures above. ()

057. REQUIREMENT TO REPAIR OR REPLACE SURFACE SEALS (RULE 57).
Whenever a Well Driller moves the permanent surface casing or damages the existing surface seal, or whenever a Well Driller discovers that a surface seal was never installed on the well or has been damaged, the Well Driller shall repair, replace, or install a minimum of eighteen feet of surface seal around the permanent casing. ()

058. -- 060. (RESERVED).

061. REQUIREMENTS FOR SEALING OF ARTIFICIAL FILTER PACK WELLS (RULE 61).
The Well Driller shall seal every artificial filter pack well in accordance with the intents, procedures and requirements of Rules 50 through 56, and adhere to the following: ()

01. Sealing of Filter Pack With Access Pipes. If the Well Driller injects filter material through access pipes or tubes, the Well Driller may inject approved seal material through the access tubes. The Well Driller shall: ()

a. Ensure that the seal around the injection pipe is watertight and that the pipe is equipped with a watertight cap or plug. ()

b. Install a watertight cap or plug on the access pipe or pipes, if the pipes are used for injecting filter pack. ()

062. REQUIREMENTS FOR SEALING OF DRIVE POINTS(RULE 62).
A drive point may not exceed a maximum depth of eighteen (18) feet below natural land surface without complying with all requirements set forth in these rules. The Well Driller shall seal every drive point in accordance with the intents and procedures of Rules 50 through 56. In addition, the Well Driller shall: ()

01. Install a minimum of five (5) feet of unperforated surface casing that meets or exceeds specifications of Rule 31.01; ()

02. Install a surface seal to a minimum depth of five (5) feet below land surface; ()

03. Ensure that the maximum depth of eighteen (18) feet below natural land surface is at no time exceeded unless all requirements of these rules are met; and ()

04. Properly abandon in accordance with these rules all holes that do not encounter water and/or will not be used. ()

063. -- 069. (RESERVED).

070. INJECTION WELLS (RULE 70).
The construction and/or modification of all injection wells shall comply with IDAPA 37.03.03, Rules for the Construction and Use of Injection Wells. Additionally, the construction, modification, and/or abandonment of all injection wells greater than 18-feet in depth shall comply with these rules. The well driller shall obtain a copy of the injection permit issued by the Department in addition to the required drilling permit prior to commencement of construction and/or modification of any injection well greater than 18-feet in depth. ()

071. CATHODIC PROTECTION WELLS (RULE 71).
Only a Well Driller shall construct, or abandon a cathodic protection well. Cathodic protection wells shall be constructed in compliance with these rules. A detailed construction plan shall be included with the drilling permit application. ()

072. MONITORING AND/OR REMEDIATION WELLS (RULE 72). ()

01. Site Specific Monitoring and/or Remediation Program Plans ~~Authorized Under Blanket Permits~~. The application for ~~a blanket~~ permit for all monitoring and/or remediation wells shall include a design proposal prepared by a licensed engineer or licensed geologist pursuant to Section 42-235, Idaho Code. Blanket permits for well networks may be approved for site-specific monitoring and/or remediation programs. ()

02. Plans and Specifications for Monitoring and/or Remediation Wells and Well Networks. The designs and specification shall demonstrate that: ()

a. The ground water resources are protected against waste and contamination; ()

b. The remediation wells will inject or withdraw only fluids, gasses or solutions approved by the Department; ()

c. The remediation and monitoring wells will be constructed so as to prevent aquifer commingling; and ()

d. The remediation and monitoring wells will be properly abandoned upon project completion and in accordance with these rules. ()

03. Use of Monitoring and/or Remediation Wells. No person may divert ground water from a remediation or monitoring well for any purpose not authorized by the Director. ()

073. ACCESS PORT (RULE 73).
All wells shall be equipped with an access port that will allow measurement of ground water level and well depth. Wells equipped with a commercially manufactured well cover cap as per Rule 30 do not require installation of an additional access port. ()

074. FLOWING ARTESIAN WELLS. (RULE 74).
All wells that flow at land surface shall be equipped with a control device as required by Section 42-1603, Idaho Code. All control devices shall: ()

a. Completely control artesian flow from the well; and ()

b. Allows for the installation and removal of a gauge to measure shut-in pressure. ()

074. -- 079. (RESERVED).

080. CONDITIONS REQUIRING THE ABANDONMENT (DECOMMISSIONING) OF A WELL (RULE 80). The well owner shall maintain every well in a manner that will prevent waste and contamination of the ground water resources. ()

01. The Director may require abandonment in accordance with these rules if the well: ()

a. Does not meet or cannot be repaired to meet these standards; ()

b. Meets the definition of Unusable Water Well; ()

c. Produces sand in excess of the limits identified in Rule 95; ()

d. Poses a threat to human health and safety, or could bring about a violation of the Ground Water Quality Rule; and/or ()

e. There is no valid water right or other specific authorization for the use of the well. ()

02. All monitoring and remediation wells, and piezometers must be abandoned in accordance with these rules upon project completion. ()

081. PERSONS AUTHORIZED TO ABANDON (DECOMMISSION) WELLS AND BOREHOLES (RULE 81).
No person shall abandon a well in Idaho without first obtaining a driller's license or receiving a waiver of the license requirement from the Director of the Department of Water Resources. Authorization is required from the Director prior to the abandonment. Upon completion of abandonment, the person who conducted the abandonment shall submit to the Department a report describing the procedures of abandonment. ()

082. PROCEDURES TO ABANDON (DECOMMISSION) WELLS AND BO~~E~~REHOLES (RULE 82).
The Director may require well abandonment in accordance with the following: ()

01. Cased Wells and Boreholes Without a Continuous Seal From Top of Intakes or Screen to the Surface. The Well Driller shall use one (1) of the following methods as applicable: ()

a. The well casing shall be perforated every five (5) feet from the bottom of the casing to within five (5) feet of the surface. Perforations made shall be adequate to allow the free flow of seal material into any voids outside the well casing. There shall be at least four equally spaced perforations per section circumference. Approved grout shall be pressure pumped to fill any voids outside of the casing. A sufficient volume shall be used to completely fill the well and annular space; or ()

b. Fill the borehole with approved seal material as the casing is being removed. ()

02. Cased Wells and Boreholes with Full-Depth Seals. If the well is cased and sealed from the top of the screen or production zone to the land surface, the well shall be completely filled with approved seal material.()

03. Uncased Wells and Boreholes. Uncased wells shall be completely filled with approved seal material. ()

04. Placement of Seal Material. Approved seal material shall be placed in accordance of the requirements of Rule 53. ()

083. COMPLETION OF A WELL (RULE 83).
Every well shall be considered complete upon removal of the drill rig from the well. The drill rig shall not be removed from a well until it is complete and meets all requirements of these rules, unless the well driller has provided written notice to the Director that the well will be properly completed or abandoned within a specified period of time. ()

084. ATTACHMENT OF A WELL TAG (RULE 84).
Upon the completion of every well, the Well Driller shall permanently affix the stainless steel well tag to the steel surface casing in a manner and location that maintains tag legibility. The tag shall be secured by a full-length weld across the top and down each side of the tag, or by using one (1) stainless steel, closed-end domed rivet near each of the four (4) corners of the tag. Prior to welding or riveting, the tag shall be pre-shaped to fit the casing such that both sides to be welded or riveted touch the casing and no gaps exist between the tag and casing. ()

085. PITLESS ADAPTERS. (RULE 84)
No person shall install a pitless adaptor in a manner that allows the entrance of fluids or other substances around the pitless assembly and into the well. The Department shall enforce instances of improper installation that cause a violation of these rules. The requirement for the installation a surface seal to a minimum depth of eighteen (18) feet below land surface as set forth in previous sections of these rules may be altered as follows when a pitless adaptor is installed: the surface seal must begin at a depth not greater than six (6) feet below land surface and extend to a minimum depth of eighteen (18) feet below land surface. The annular space above the pitless adaptor or assembly shall be filled with materials not more permeable than the surrounding, undisturbed, native ground. ()

086. UNPRODUCTIVE (DRY HOLE) WELL. (RULE 85)
If after drilling the quantity of water to meet a beneficial use cannot be obtained, the Well Driller shall abandon the well in accordance with these rules. ()

087. -- 090. (RESERVED).

091. EXPLOSIVES. (RULE 91)
The use of explosives inside the well casing is prohibited unless specifically authorized by the Director. ()

092. HYDRO-FRACTURING. (RULE 92)
Hydro-fracturing shall be performed only by Idaho-licensed well drillers. The pressure shall be transmitted through a drill string and shall not be transmitted to the well casing. The driller shall provide a report to the Director of the fracturing work which shall include well location, fracturing depth, fracturing pressures and other data as requested by the Department. ()

093. DRILLING FLUIDS AND DRILLING ADDITIVES (RULE 93).
The Well Driller must use only potable water and shall use only drilling fluids or drilling additives that are manufactured for use in water wells, are National Sanitary Foundation (NSF), American Petroleum Institute (API), or ASTM/ANSI approved; and do not contain a concentration of any substance in excess of Primary Drinking Water Standards, as set forth in IDAPA 58.01.08, "Rules for Public Drinking Water Systems" in accordance with the manufacturer's specifications. The Well Driller may seek approval from the Director to use specific products on a case-by-case basis. In addition, the Well Driller shall ensure the containment of all drilling fluids and materials used or produced to the immediate drilling site, and shall not dispose of such fluids or materials into any streams, canals, wells, or other subsurface pathways. ()

094. DISINFECTION AND DECONTAMINATION (RULE 94).
Every person shall clean and/or disinfect as required casing, tools, drilling equipment and materials, the pump, electrical wiring and controls, drop pipe, and all other equipment each and every time immediately prior to said equipment being inserted into the well. ()

01. Duties of Well Drillers. Well Drillers shall

~~**a.** Clean all casing, tools, drilling equipment, and materials prior to beginning the drilling and construction of every well. ()~~

a~~b~~. Clean and disinfect all casing, tools, drilling equipment, and materials prior to insertion into every existing well.

b~~c~~. Disinfect all pumping equipment and sand or gravel used in an artificial filter-packed well and used to develop and pump test the well. ()

c~~d~~. Use only potable water for drilling and for mixing of sealing material and shall ensure that the water has a chlorine residual of not more than one (1) part per million of free chlorine. ()

02. Disinfection Procedures. Every person shall clean and disinfect all equipment each and every time and immediately prior to the equipment being placed into the well. ()

a. Each person shall disinfect every well, the pump, electrical wiring ~~and controls~~, drop pipe, and all other equipment using a fifty (50) mg/L chlorine solution. ()

b. Every person shall use all disinfectants in accordance with manufacturer's instructions. ()

c. No person shall pour, dispose, dump, discharge, or inject any fluid, liquid, or chemical into a well that would exceed the Primary Drinking Water Standards, as set forth in the current IDAPA 58.01.08, "Rules for Public Drinking Water Systems." ()

d. Every person shall maintain at all times on every well site adequate chlorine compounds, tools, and equipment to disinfect the well, the pump, electrical wiring and controls, drop pipe, and all other equipment in accordance with the following table. ()

Chlorine compound required to dose 100-ft. of water-filled well at 50 mg/L				
Casing Diameter (in.)	Volume of water in casing per 100 ft. of water depth (gallons)	Amount of Chemical Compound needed for each 100 ft. of water		
		Calcium Hypochlorite[1] (65% available Cl_2)	Sodium Hypochlorite[2] (12 trade %)	Liquid Chlorine[3] (100% available Cl_2) (pounds)
4	65.28	0.7 oz	3.5 oz	0.03
6	146.2	1.5 oz	7.8 oz	0.06
8	261.1	2.7 oz	13.9 oz	0.11
10	408.0	4.2 oz	1.4 pt	0.17
12	587.5	6.0 oz	2.0 pt	0.25
16	1044.0	10.7 oz	3.5 pt	0.44
20	1632.0	1 lb 1oz	0.7 gal	0.68
24	2350.0	1 lb 8 oz	1.0 gal	0.98
30	3672.0	2 lbs 6 oz	1.5 gal	1.53
36	5287.0	3 lbs 6 oz	2.2 gal	2.21
48	9400.0	6 lbs 1 oz	3.9 gal	3.92
60	14690.0	9 lbs 7 oz	6.1 gal	6.13

Footnotes:
[1]The quantity of Calcium Hypochlorite is based on 65 percent available chlorine by dry weight.
[2]The quantity of Sodium Hypochlorite is based on 12-trade-percent available chlorine by US liquid measure. (Trade percent is a term used by chlorine manufacturers. Trade percent x 10 = grams of available chlorine in 1 L of solution.)
[3]Quantity of liquid chlorine is based on 100 percent available chlorine by weight.

()

095. SAND PRODUCTION, WELL SCREENS AND INTAKES (RULE 95).

01. The Well Driller shall construct every well to limit the continued production of sand and other sediment particles larger than silt. For the purpose of this rule, sand shall be considered as any sediment particle retained on a US standard sieve #200. The maximum sand content produced shall not exceed 15ppm. If necessary to

meet this requirement, the well driller shall install appropriately sized well screens, perforated intakes, and/or filter pack(s). Wells used in connection with a public water system have more stringent requirements. ()

02. The Well Driller shall not install well screens, perforations, or other intakes that extend into or through any confining layer separating aquifers or zones of differing artesian pressure. ()

03. The Well Driller shall not install well screens, perforations, or other intakes into or through any confining layer that would otherwise prevent the migration of water from one zone to another. ()

096. WELL DEVELOPMENT AND TESTING (RULE 96).

The Well Driller shall develop every new well to maximize the yield. The Well Driller shall determine the static ground water level, pumping water level, and the production rate of every well. The production rate shall be determined by a test of at least one (1) hour in duration. This information shall be documented on the Well Driller's report. ()

097. CLOSED LOOP HEAT EXCHANGE WELLS (RULE 97).

The Well Driller shall construct closed loop heat exchange wells in accordance with the intents, procedures and requirements of these rules and to prevent waste, contamination and/or aquifer commingling. The Well Driller is not required to install casing in such wells. ()

01. Installation of Closed Loop Wells. When constructing a closed loop heat exchange well, the Well Driller shall: ()

a. Construct each borehole of sufficient size to allow the placement of approved seal material; ()

b. Seal the annular space of each borehole with approved seal material as required by these rules and in accordance with the intents and procedures of Rules 50 through 63. Those portions of a borehole not requiring a seal to achieve the above may be backfilled with drill cuttings, gravel, and/or sand; ()

c. Install fluid-tight circulating pipe, composed of high-density polyethylene, grade PE3408, minimum cell classifications PE355434C or PE345434C conforming to ASTM Standard D3350, or other Department-approved pipe; ()

d. Join pipe using thermal fusion techniques according to ASTM Standards D-3261 or D-2683; ()

e. Use only propylene glycol, or other Department-approved circulating fluid; ()

f. Ensure that any other system additive is NSF compliant and has prior Department approval; ()

g. Pressure test the system with potable water at 100% of the designed system operating pressure for a minimum duration of 24 hours; and ()

h. Properly abandon all loops failing the test by pressure pumping approved seal material through the entire length of each failed loop. After grouting, loop ends shall be fused together or capped. ()

098. -- 200. (RESERVED).

201. CONSTRUCTION OF LOW TEMPERATURE GEOTHERMAL RESOURCE WELLS AND BONDING (RULE 201). ()

01. General. Drillers constructing low temperature geothermal resource wells (bottom hole temperature more than eighty-five (85) Degrees F and less than two hundred twelve (212) Degrees F) shall be qualified under IDAPA 37.03.10, Well Driller Licensing Rules. All low temperature geothermal resource wells shall be constructed in such a manner that the resource will be protected from waste due to lost artesian pressure or temperature. The owner or well driller is required to provide bottom hole temperature data, but the Director may make the final determination of bottom hole temperature, based upon information available to him. ()

a. All standards and guidelines for construction and abandonment of cold water wells shall apply to low temperature geothermal resource wells except as modified by Rule 201 Subsections herein. ()

b. A drilling prospectus shall be submitted to and approved by the Director prior to the construction, modification, deepening or abandonment of any low temperature geothermal resource well. The well owner and the well driller are responsible for the prospectus and subsequent well construction. ()

02. Well Owner Bonding. The owner of any low temperature geothermal resource well shall file a surety bond or cash bond as required by Section 42-233, Idaho Code, with the Director in an amount not less than five thousand dollars ($5,000) nor more than twenty thousand dollars ($20,000) payable to the Director prior to constructing, modifying or deepening the well after July 1, 1987. The bond amount shall be determined by the Director within the following guidelines. The bond shall be kept in force for one (1) year following completion of the well or until released in writing by the Director, whichever occurs first. ()

a. Any well less than three-hundred (300) feet deep with a bottom hole temperature of less than one hundred twenty (120) Degrees F and a shut-in pressure of less than ten (10) pounds per square inch gage (psig) at land surface shall maintain a bond of five thousand dollars ($5,000). ()

b. The owner of any well three hundred (300) feet to one thousand (1,000) feet deep with a bottom hole temperature of less than one hundred fifty (150) Degrees F and a shut-in pressure of less than fifty (50) psig at land surface shall maintain a bond of ten thousand dollars ($10,000). ()

c. The owner of any low temperature geothermal resource well not covered by Rules Subsections 201.02.a. and201.02.b. shall maintain a bond of twenty thousand dollars ($20,000). ()

d. The Director may decrease or increase the bonds required if it is shown to his satisfaction that well construction or other conditions merit an increase or decrease. ()

e. The bond requirements of Section 42-233, Idaho Code, are applicable to wells authorized by water right permits or licenses having a priority date earlier than July 1, 1987, if the well authorized by the permit or license was not constructed prior to July 1, 1987 or if an existing well constructed within the terms of the permit or license is modified, deepened or enlarged on or after July 1, 1987. ()

03. Casing. Low temperature geothermal resource wells shall be protected from cooling by preventing intermingling with cold water aquifers and from loss of pressure by preventing flow into zones of lower pressure. ()

a. Casing which meets or exceeds the minimum specifications for permanent steel casing of Rule Subsection 031.01 shall be installed in every well. The Director may require a more rigid standard for collapse and burst strength as depths or pressures may dictate. Every low temperature geothermal resource well which flows at land surface shall have a minimum of forty (40) feet of conductor pipe set and cemented its entire length. ()

b. Casing shall be installed from twelve (12) inches above land surface into the overlying confining strata of the thermal aquifer. The casing schedule may consist of several different casing strings (i.e. conductor pipe, surface casing, intermediate casing, production pipe) which may all extend to land surface or may be overlapped and sealed or packed to prevent fluid migration out of the casing at any depth. ()

i. Low temperature geothermal resource wells less than one thousand (1,000) feet deep and which encounter a shut-in pressure of less than fifty (50) psig at land surface shall have two (2) strings of casing set and cemented to land surface. Conductor pipe shall be a minimum of forty (40) feet in length or ten percent (10%) of the total depth of the well whichever is greater. Surface casing shall extend into the confining stratum overlying the aquifer. ()

ii. Low temperature geothermal resource wells one thousand (1,000) feet or more in depth or which will likely encounter a shut-in pressure of fifty (50) psig or more at land surface require prior approval of the drilling plan by the Director and shall have three (3) strings of casing cemented their total length to land surface. Conductor

pipe shall be a minimum length of forty (40) feet. Surface casing shall be a minimum of two hundred (200) feet in length or ten percent (10%) of the total depth of the well, whichever is greater. Intermediate casing shall extend into the confining stratum overlying the aquifer. ()

c. Rule Subsection201.03.b. may be waived if it can be demonstrated to the Director through the lithology, electrical logs, geophysical logs, injectivity tests or other data that formations encountered below the last casing string set, will neither accept nor yield fluids at anticipated pressure to the borehole. ()

d. A nominal borehole size of two (2) inches in diameter larger than the Outside Diameter (O.D.) of the casing or casing coupler (whichever is larger) shall be drilled. All casing designations shall be by O.D. and wall thickness and shall be shown to meet a given specification of the American Petroleum Institute, the American Society for Testing and Materials, the American Water Works Association or the American National Standards Institute. The last string of casing set during drilling operations shall, at the Director's option, be flanged and capable of mounting a valve or blow out prevention equipment to control flows at the surface before drilling resumes. ()

04. Sealing of Casing. All casing shall be sealed its entire length with cement or a cement grout mixture unless waived by the Director. The seal material shall be placed from the bottom of the casing to land surface either through the casing or tubing or by use of a tremie pipe. The cement or cement grout shall be undisturbed for a minimum of twenty-four (24) hours or as needed to allow adequate curing. ()

a. A caliper log may be run for determining the volume of cement to be placed with an additional twenty-five (25%) percent on site ready for mixing. If a caliper log is not run, an additional one hundred (100%) percent of the calculated volume of cement shall be on site ready for placement. ()

b. If there is no return of cement or cement grout at the surface after circulating all of the cement mixture on site, the Department will determine whether remedial work should be done to insure no migration of fluids around the well bore. ()

c. The use of additives such as bentonite, accelerators, retarders, lost circulation material shall follow manufacturer's specifications. ()

05. Blow Out Prevention Equipment. The Director may require the installation of gate valves or annular blow out prevention equipment to prevent the uncontrolled blow out of drilling mud and geothermal fluid. ()

06. Repair of Wells. The well driller shall submit a drilling prospectus to the Director for review and approval prior to the repair or modification of a low temperature geothermal resource well. ()

07. Abandoning of Wells. Proper abandonment of any low temperature geothermal resource well requires the following: ()

a. Approved Cement grout shall be pressure pumped into the hole through drill pipe or~~tremmie~~tremie. ()

b. All open annular spaces shall be completely filled with approved cement grout. ()

c. Pressure pumping shall create a cement plug at least one hundred (100) feet in vertical depth shall be placed straddling (fifty (50) feet above and fifty (50) feet below) the zone where the casing or well bore meets the upper boundary of each ground water aquifer. ()

d. A minimum of one hundred (100) feet of cement shall be placed straddling each drive shoe or guide shoe on all casing including the bottom of the conductor pipe. ()

e. A surface plug of either cement grout or concrete shall be placed from at least fifty (50) feet below the top of the casing to the top of the casing. ()

f. A cement plug shall extend at least fifty (50) feet above and fifty (50) feet below the top of any liner installed in the well. The Director may waive this rule upon a showing of good cause. ()

g. Other abandonment procedures may be approved by the Director if the owner or operator can demonstrate that the low temperature geothermal resource, ground waters, and other natural resources will be protected. ()

h. Approval for abandonment of any low temperature geothermal well must be in writing by the Director prior to the beginning of any abandonment procedures. ()

202. -- 310. (RESERVED).

311. PUBLIC WATER SUPPLY WELLS (RULE 311).
The Well Driller shall be responsible for compliance with all additional requirements as established by other authorized regulatory bodies in the construction, modification or abandonment of any Public Water Supply Well according to IDAPA 58.01.08, "Idaho Rules for Public Drinking Water Systems". These additional requirements include, but are not limited to, health standards, separation distances, aboveground casing height, and sealing requirements. ()

312. SPECIAL STANDARDS FOR CONSTRUCTION OF WELLS WHEN MINERALIZED OR CONTAMINATED WATER IS ENCOUNTERED (RULE 312).
If mineralized or contaminated water is encountered during the construction of a well, , the Well Driller shall take the appropriate steps necessary to prevent the poor quality waters from entering the well or moving up or down the annular space around the well casing. The Well Driller shall determine the method employed to case and seal out this water, provided the minimum standards are met. The Well Driller will take special precautions to prevent water of inferior quality from moving vertically in the filter pack in a filter-pack well. All actions taken will be clearly documented on the Well Driller's report. ()

313. DISTANCES FROM CONTAMINATION SOURCES (RULE 313).
The Well Driller shall ensure the location of every well in accordance with minimum setback distances from contamination sources established by District Health Departments, and as required by IDAPA 58.01.03, "Individual/Subsurface Sewage Disposal Rules", and IDAPA 58.01.08, "Idaho Rules for Public Drinking Water Systems." ()

314. OWNERS RESPONSIBILITIES FOR WELL MAINTENANCE (RULE 314).
After a well is complete, the well owner shall: ()

01. Maintenance.

a. Not allow modification to wells under their control without first obtaining an approved IDWR permit, pursuant to Section 42-235, Idaho Code; ()

b. Maintain the minimum casing height of twelve (12) inches above land surface and finished grade; ()

c. Maintain the appropriate well cap, and control device if required, according to Rule Subsection 30.02.d and Rule 74; and ()

d. Any person owning or controlling a well shall maintain the well to prevent waste or contamination of ground waters through leaky casings, pipes, fittings, valves, pumps, seals or through leakage around the outside of the casings, whether the leakage is above or below the land surface. Any person owning or controlling a non-compliant ~~leaking~~ well shall be responsible for the repair of the well in accordance with these rules within one (1) year of the discovery of ~~leakage~~ the violation. ()

02. New Construction. Prevent construction of a building or structure closer than ten (10) ft. from an existing well. ()

03. Septic Tanks and Drainfields. Prevent construction or installation of septic tank drainfields and areas designated for replacement drainfields within one hundred (100) ft. of an existing well: ()

a. Ensure that septic tanks are installed greater than fifty (50) ft. from an existing well; and ()

b. Ensure that septic tanks into which more than two thousand five hundred (2,500) gallons per day (gpd) of sewage are discharged are located more than three hundred (300) ft. from an existing well. ()

04. Unusable Wells. The Well Owner shall abandon any unusable well in accordance with these rules within 24 months. ()

315. -- 320. (RESERVED).

321. AREAS OF DRILLING CONCERN (RULE 321).

01. General.

a. The Director may designate an "area of drilling concern" to protect public health, or to prevent waste and contamination of ground and/or surface water because of factors such as aquifer pressure, vertical depth to the aquifer, warm or hot ground water, or contaminated ground or surface waters. ()

b. The designation of an area of drilling concern does not supersede or preclude designation of part or all of an area as a Critical Ground Water Area (Section 42-233a, Idaho Code), Ground Water Management Area (Section 42-233b, Idaho Code), or Geothermal Resource Area (Sections 42-4002 and 42-4003, Idaho Code). ()

c. The designation of an area of drilling concern can include certain aquifers or portions thereof while excluding others. The area of drilling concern may include low temperature geothermal resources while not including the shallower cold ground water systems. ()

02. Bond Requirement. ()

a. The minimum bond to be filed by the well driller with the Director for the construction or modification of any well in an area of drilling concern shall be ten thousand dollars ($10,000) unless it can be shown to the satisfaction of the Director that a smaller bond is sufficient. ()

b. The Director may determine on a case-by-case basis if a larger bond is required based on the estimated cost to repair, complete or properly abandon a well. ()

03. Additional Requirements. ()

a. A driller shall demonstrate to the satisfaction of the Director that he has the experience and knowledge to adequately construct or abandon a well which encounters warm water or pressurized (artesian) aquifers. ()

b. A driller shall demonstrate to the satisfaction of the Director that he has, or has immediate access to, specialized equipment or resources needed to adequately construct or abandon a well. ()

322. -- 324. (RESERVED).

325. DRILLING PERMIT REQUIREMENTS (RULE 325).

01. General Provisions. ()

a. The owner of a well to be constructed, drilled, deepened or enlarged on or after July 1, 1987 shall obtain a drilling permit from the Director prior to construction or drilling of the well. ()

b. The owner of a well under construction prior to July 1, 1987, for which the drilling equipment is at the site and construction is ongoing, shall not be required to obtain a drilling permit, provided that construction of the well was complete by August 1, 1987. The Director may extend the date for good cause. ()

c. The Director may issue a drilling permit to the owner of a proposed well, to the driller employed to construct the well, or to the owner's representative. ()

d. Drilling permits will not be issued for construction of a well which requires another separate approval from the department, such as a water right permit, transfer, amendment or injection well permit, until the other separate approval has been given by the department. The Director may grant a waiver if he determines that the public interest will be served by an expedited approval. ()

e. The Director may give verbal approval to a well driller for the construction of certain wells such as single family domestic wells and stockwater wells which do not require other separate approvals from the department, provided the driller files the drilling permit and appropriate fee with the Director within thirty (30) days of the verbal approval. ()

f. The Director may give verbal approval to a well driller for the construction of a well for which other permitting requirements have been met, provided the driller files the drilling permit and appropriate fee with the Director within thirty (30) days of the verbal approval. ()

g. The Director will not give a verbal approval for well construction or drilling in a designated area of drilling concern. ()

h. Failure of the driller to submit a completed drilling permit and fee within the thirty (30) day period after receiving verbal approval to construct a well is cause for the Director to seek the penalties provided by statute and by these rules. ()

i. After the effective date of these rules, a well driller shall not construct, drill or modify any well until a drilling permit has been issued or verbal approval is given. ()

02. Effect of a Permit. ()

a. A drilling permit authorizes the construction, drilling or modification of a well in compliance with the conditions of approval on the permit. ()

b. A drilling permit does not constitute a water right permit, injection well permit or other authorization which may be required from the department prior to actual well construction and does not authorize use of water from the well or discharge of fluids into the well. ()

c. A drilling permit may not be assigned from one (1) owner to another. ()

d. A drilling permit authorizes the construction of one (1) well (except group monitoring well drilling permits) unless other holes started under terms of the permit are properly abandoned and the department is advised of the abandonment. ()

03. Exclusions. ()

a. Geotechnical borings for the purpose of mineral exploration or for the design of foundations for structures or for the design of dams and embankments are not subject to the drilling permit requirement but shall be constructed and abandoned in accordance with minimum well construction standards. ()

b. The Director may require abandonment of wells constructed pursuant to Rule 325.03.a. if the wells are determined to cause waste or contamination of the ground water. ()

c. Wells constructed pursuant to Rule Subsection 325.03.a. shall be abandoned in compliance with adopted rules when use of the wells cease. ()

04. Fees. ()

a. A drilling permit fee is not required for a well constructed and completed prior to July 1, 1987, provided the well is not deepened or the dimensions of the well are not increased on or after July 1, 1987. ()

b. The drilling permit fee for construction of a well for a single family domestic use, stockwater use, class V(c) heat exchange injection associated with a single family domestic use or monitoring use or for any use with a rate of diversion of four one hundredth (0.04) cubic feet per second or less and for the storage of four (4) acre-feet per year or less shall be ten ($10) dollars. (See IDAPA 37.03.03, "Rules for Construction and Use of Injection Wells" for the description of class V(c) injection wells). ()

c. The Director may issue a blanket drilling permit for site specific monitoring programs prepared by a licensed engineer or licensed geologist as provided in Section 42-235, Idaho Code, upon submittal of a fifty dollar ($50) fee. ()

d. The drilling permit fee for well uses which are not included in Rules Subsections 325.04.b. and 325.04.c. shall be one hundred dollars ($100). ()

e. The difference between the drilling permit fee required by Rules Subsections 325.04.b. through 325.04.d., as applicable, shall be paid when an existing well constructed on or after July 1, 1987, for which the lower drilling permit fee was paid, is authorized by the Department for a use which would require the larger drilling permit fee. This rule applies even though the existing well is not deepened or the dimensions of the well are not increased. ()

f. A drilling permit fee will not be required for a new or additional use from an existing well constructed on or after July 1, 1987, when the drilling permit fee for the new or additional use is the same amount which was previously paid for construction of the well in connection with the existing use. ()

326. -- 998. (RESERVED).

999. PENALTIES (RULE 999).
A person owning or controlling a well that allows waste or contamination of the state's ground water resources or causes a well not to meet the construction standards provided in these rules, is subject to the civil penalties as provided by statute. A driller who violates the foregoing provisions of these minimum well construction standards rules is subject to the penalty provisions specified in Sections 42-238 and 42-238b, Idaho Code. ()

Appendices

Appendix 1: Well Sealing Diagrams

Appendix 2: Pressure Pumping Methods

Appendix 3: References

- API: Grout Mixes, etc.
- ASTM: F 480, and others specs for casing, collapse strengths, etc.
- IDWR Flood Plain Maps Link (see Scott, only Ada County is currently properly geo-referenced to add to locator tool)
- Idaho Code, Title 42, Title 47 and Title 67 Links
- Idaho Public Records Act , Title 3, Chapter 3

- ASTM SDR/Schedules Rating Guides
- IDAPA 37.03.03 Rules for the Construction and Use of Injection Wells
- IDAPA 58.01.08 Idaho Rules for Public Drinking Water Systems
- IDAPA 58.01.03 Individual/Subsurface Sewage Disposal Rules
- IDAPA 58.01.11 Ground Water Quality Rule
- IDAPA 37.01.01 Rules of Procedure of the Idaho Department of Water Resources
- IDAPA 37.01.10 Well Driller Licensing Rules
- IDWR Well Construction & Injection Well Website links
- DEQ and Health District Website links and contacts
- API/NSF/ANSI/ASTM and American Water Works Association links and contacts (API RP10B-2 "Recommended Practice for Testing Oil Well Cements and Cement Additives)
- US Standard Sieve Sizes